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PATENT APPLICATION
Attorney's Docket No.: 3022.1004-000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Joerg Schneider, Sarah C. Gilbert, Carolyn M. Hannan and Adrian V.S. Hill

Application No.: 10/088,677 Group: 1645

371(c) Date: May 31, 2002 Examiner: Zeman, Robert A.

Confirmation No.: 4825

For: Use of Replication-Deficient Adenoviral Vector to Boost CD8+ T Cell Immune Response to Antigen

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PETITION FROM REQUIREMENT FOR RESTRICTION UNDER 37 C.F.R §1.144

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Petition From Requirement For Restriction Under 37 C.F.R. §1.144 is being filed in response to the Restriction Requirement deemed final in the Office Action mailed from the U.S. Patent and Trademark Office (PTO) on March 21, 2006 (the "Office Action") in the above-identified application. Applicants petition the Director to reconsider and withdraw the Restriction Requirement for the reasons set forth below.

An Amendment in response to the Office Action mailed from the U.S. Patent and Trademark Office on March 21, 2006 in the above-identified application is being filed concurrently.

In the Restriction Requirement mailed from the U.S. PTO on December 15, 2004 (the "Restriction Requirement") in the above-identified application, the Examiner required restriction among three groups of claims:

> Claims 9 and 14-16 drawn to a method of boosting a CD8+ T cell immune response to an antigen in an individual, wherein said individual is previously primed with a non-adenoviral vector;
>
> Claims 10, 12 and 13 drawn to a method of inducing a CD8+ T cell immune response, comprising administering to the individual a priming composition comprising the antigen or a CD8+ T cell epitope of said antigen; and
>
> Claims 10-13 drawn to a method of inducing a CD8+ T cell immune response, comprising administering to the individual a priming composition comprising nucleic acid encoding the antigen or a CD8+ T cell epitope of said antigen.

The Examiner states that the inventions listed as Groups I-III do not relate to a single general inventive concept because "the Invention of Group I was found to have no special technical feature that defined the contribution over the prior art of Kazanji *et al.*" (Restriction Requirement, page 2). It is the Examiner's opinion that Kazanji *et al.* teach "a method of boosting a CD 8+ immune response in malaria DNA vaccine" in which "[p]riming with plasmid DNA encoding a pre-erythrocytetic antigen of Plasmodium berghei followed by a boost with recombinant modified vaccinia virus" was performed (Restriction Requirement, page 3). The Examiner concludes that "[s]ince Applicant's Inventions do not contribute a special technical feature when viewed over the prior art they do not have a single general inventive concept and so lack unity of invention" (Restriction Requirement, page 3).

In the Reply to the Restriction Requirement mailed to the U.S. PTO on January 18, 2005 (the "Reply"), Applicants amended Claim 10 to indicate that the boosting composition used in

the method is heterologous (*i.e.*, different from the priming composition), and elected Group III with traverse. Applicants pointed out that with the amendment of Claim 10, the claims in each group are directed to "administration of a replication-deficient adenoviral vector encoding an antigen, to boost an immune response to the antigen in an individual, where the individual was previously primed with a heterologous composition", which defines an inventive contribution over the prior art, is a special technical feature within the meaning of Rule 13 PCT, and confers unity on all the claims (Reply, page 6).

In response to Applicants' traversal of the Restriction Requirement, the Examiner states that Kazanji *et al.* "disclose the administration of naked DNA plasmids containing the HTLV-1-*env* gene as the 'primer' and the administration of Ad5 containing the HTLV-1-*env gp46* gene as the 'booster'" and "[s]ince the genes administered in the 'primer' and the 'booster' are different and the form of said compositions are different (i.e. naked DNA plasmid vs. Ad5 viral vector), said compositions are deemed to be heterologous to one another" (Office Action mailed March 21, 2006, page 2). The Examiner concludes that "the special technical feature to which Applicant refers does not constitute a contribution over the prior art", and thus, "there is no unity" (Office Action, page 2).

Applicants respectfully disagree. Kazanji *et al.* states that the "initial aim of the experiment was to compare immunization with the complete HTLV-1-*env* gene inserted into the adenovirus vector (Ad5-HTLV-1-*env*) or in a naked DNA plasmid (pMLP-HTLV-1-*env*)" (Kazanji *et al.*, pages 302-303). The "vaccination protocols using different vectors are shown in Table I (A, B and C)" of the Kazanji *et al.* reference (Kazanji *et al.*, column 1, under the heading "Animals, vaccination regimens and challenges with HTLV-1"). Kazanji *et al.* either used 1) an Ad5-HTLV-1-*env* for priming and an Ad5-HTLV-1-*gp46* or recombinant gp46 protein for boosting (Kazanji *et al.*, page 301,Table IA) ***or*** 2) the naked DNA expression vector pMLP-HTLV-1-*env* for priming and a naked DNA expression vector pMLP-HTLV-1-*gp46* or recombinant gp46 protein for boosting (Kazanji *et al.*, page 301, Table IB). Kazanji *et al.* used adenovirus to prime an adenoviral or recombinant protein boost (Kazanji *et al.*, page 301, Table IA) and DNA to prime a DNA or recombinant protein boost (Kazanji *et al.*, page 301, Table IB), and thus, disclose using adenovirus in a homologous prime-boost context when adenovirus is used as a boosting composition.

In contrast, Applicants disclose using adenovirus in a heterologous prime-boost context when adenovirus is used as a boosting composition. That is, Applicants' claimed invention is directed to administering a replication-deficient adenoviral vector which encodes an antigen, for boosting a priming composition providing the same antigen, wherein the prime and boost are heterologous, *i.e.,* different vectors. Kazanji *et al.* do not teach Applicants' claimed heterologous prime-boost method in which the boost comprises a replication-deficient adenoviral vector which includes the antigen or a CD8+ T cell epitope of the antigen against which an immune response is to be induced, and the prime comprises the antigen or a CD8+ T cell epitope of the antigen which is included in a composition that is ***not*** the same replication-deficient adenoviral vector.

Therefore, the claimed inventions of Groups I-III relate to a single general inventive concept as required for unity of invention under PCT Rule 13.1, because there is a technical relationship among the inventions involving a special technical feature (a heterologous replication-deficient adenoviral boost) that defines a contribution which each of the claimed inventions, considered as a whole, makes over the prior art of the Kazanji *et al.* reference.

Applicants respectfully request that the Director reconsider and withdraw the Restriction Requirement based on lack of unity in the above-referenced application.

Please charge any Petition fees that may be due in this matter to Attorney's Deposit Account No. 08-0380. A copy of this paper is enclosed for accounting purposes.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Anne J. Collins

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Dated: July 26, 2006

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